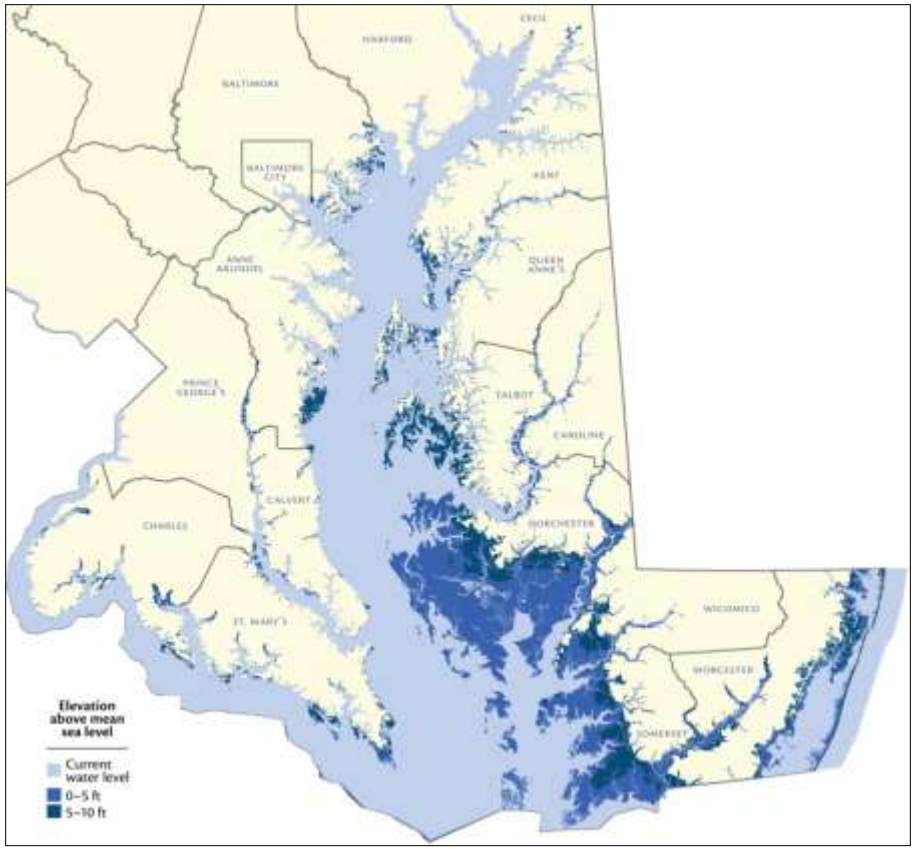
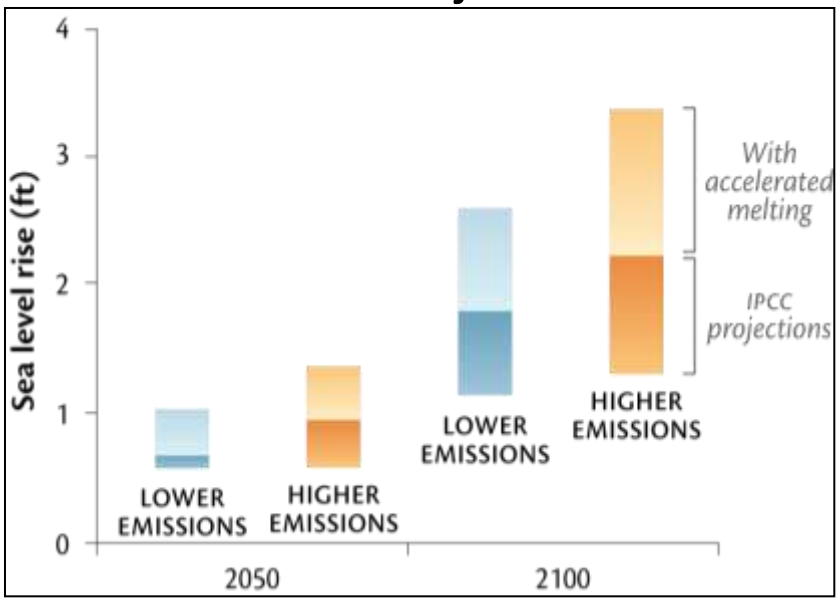
Maryland's Sea Level Rise Strategy

Maryland's Vulnerability to Sea Level Rise



Maryland's Risk from Sea Level Rise

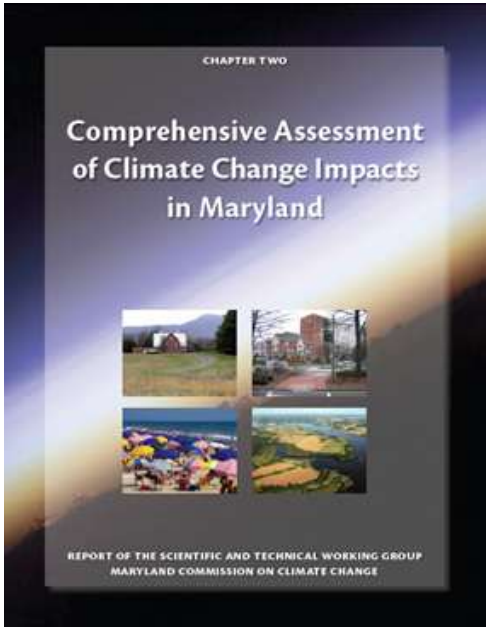
Future Projections

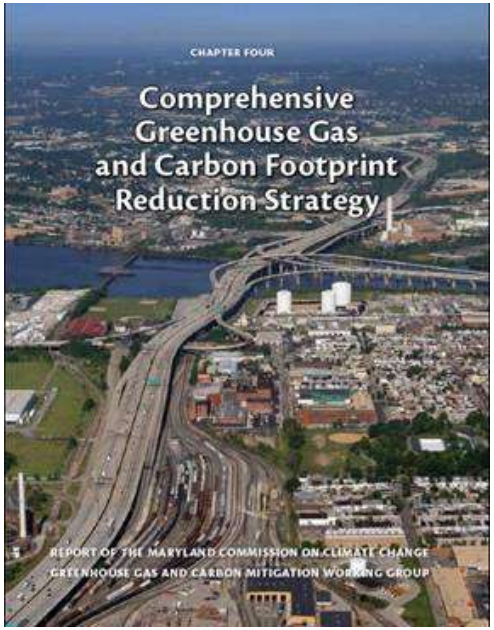


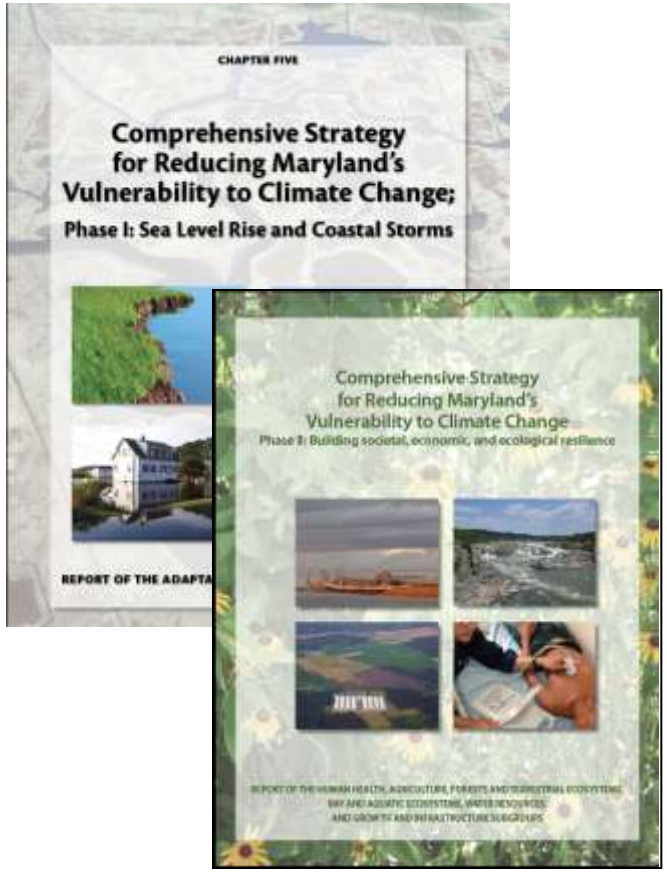
Impacts to the Coastal Zone

- Inundation of low-lying lands
- Increased flooding/storm surge
- More shoreline erosion
- Saltwater intrusion
- Higher water tables

Maryland Climate Action Plan







Phase I: Sea Level Rise & Coastal Storms
"Vision for the Future"

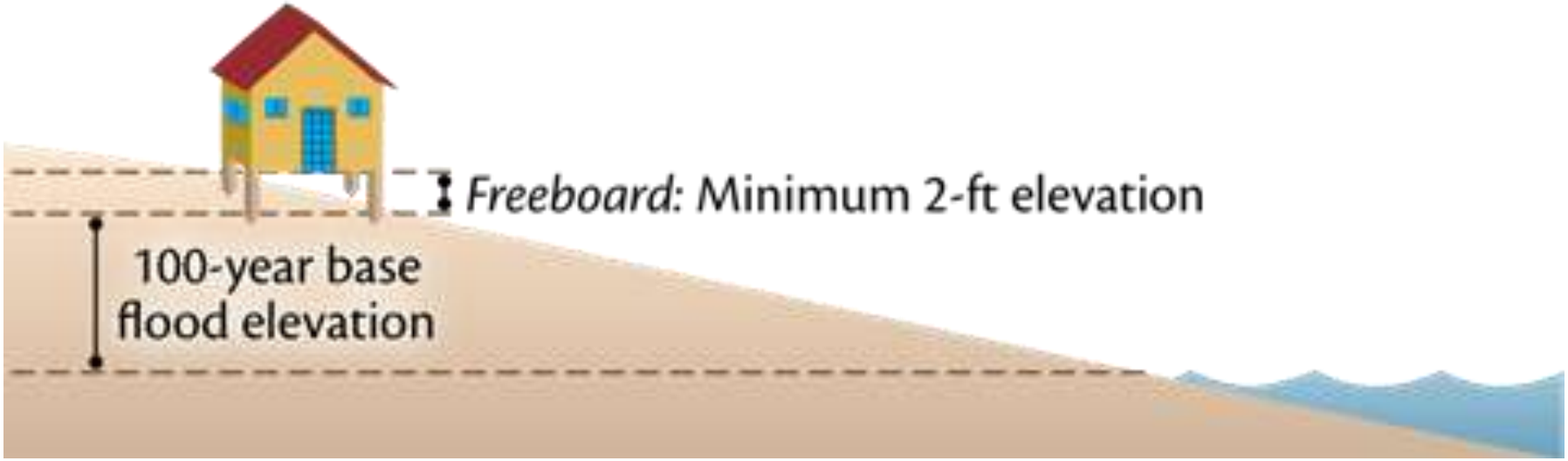
Promote programs and policies aimed at the avoidance and/or reduction of impact to the existing-built environment, as well as to future growth and development in vulnerable coastal areas

Shift to sustainable economies and investments; and, avoid assumption of the financial risk of development and redevelopment in highly hazardous coastal areas

Enhance preparedness and planning efforts to protect human health, safety and welfare

Protect and restore Maryland's natural shoreline and its resources, including its tidal wetlands and marshes, vegetated buffers, and Bay Islands, that inherently shield Maryland's shoreline and interior

Strategy: Enhance Siting & Design for Coastal Infrastructure



Elevate new and/or replacement structures 2+ feet above the current 100-year base flood elevation

Strategy: Adaptation of Vulnerable Coastal Infrastructure

State Maintained Roads & Structures Vulnerable to Sea Level Rise

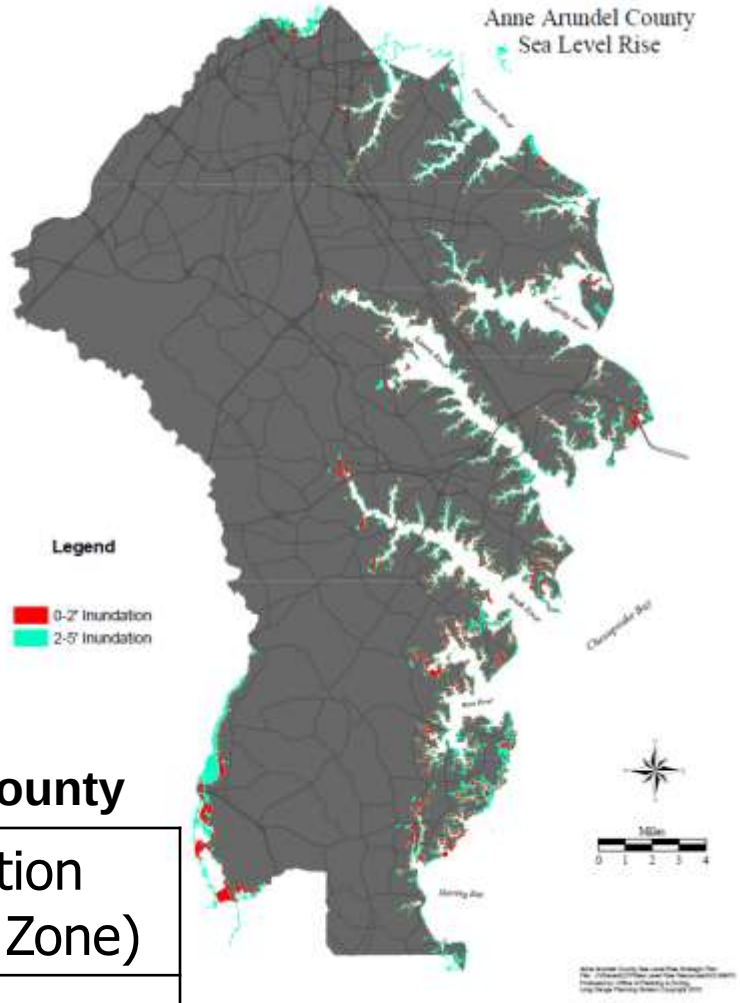
SLR Projection	Road Miles	Structures (#)
2 Feet	156	93
5 Feet	371	132
10 Feet	792	196

MD State Highway Admin (2010)

Strategy: Minimize Impacts to Human Health

- Septic systems located less than 2 feet above mean sea level are at risk of sea level rise inundation in the next 50 years.

- There are thousands of existing systems in this zone across the state (5,206 in Anne Arundel County alone).



Vulnerable Septic Systems in Anne Arundel County

0 – 2 ft Inundation (50-Year Impact Zone)	0 – 5 ft Inundation (125-Year Impact Zone)
5,206	7,238

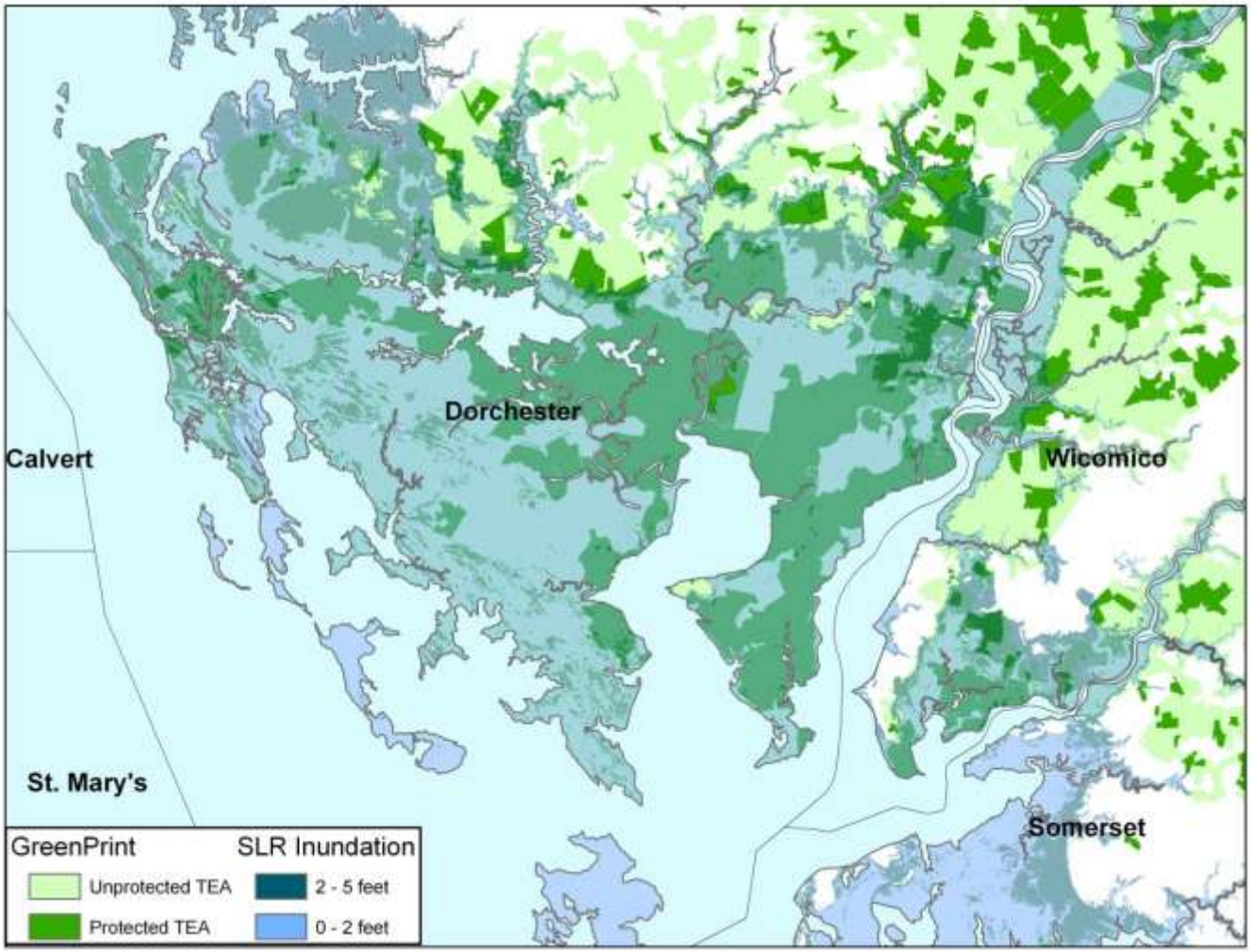
Source: AA County (2010)

Strategy: Avoid Loss of Historical, Archaeological & Cultural Resources

- More than 12,600 archeological sites have been inventoried statewide
- 2539 archeological sites are potentially vulnerable within the 0-5 ft boundaries. This represents 20% of all recorded archeological sites statewide, and 32% of all of the sites recorded in the coastal counties studied.
- The types of sites represented are predominantly prehistoric, ranging from Paleoindian to the contact period, but nearly a third have historic components, including 57 with identified 17th century components.
- Most at risk:
  - Paleoindian (9,000-11,000 BC)
  - Contact Period and 17th Century
  - Total of 228 sites statewide
  - 12 are already partially submerged

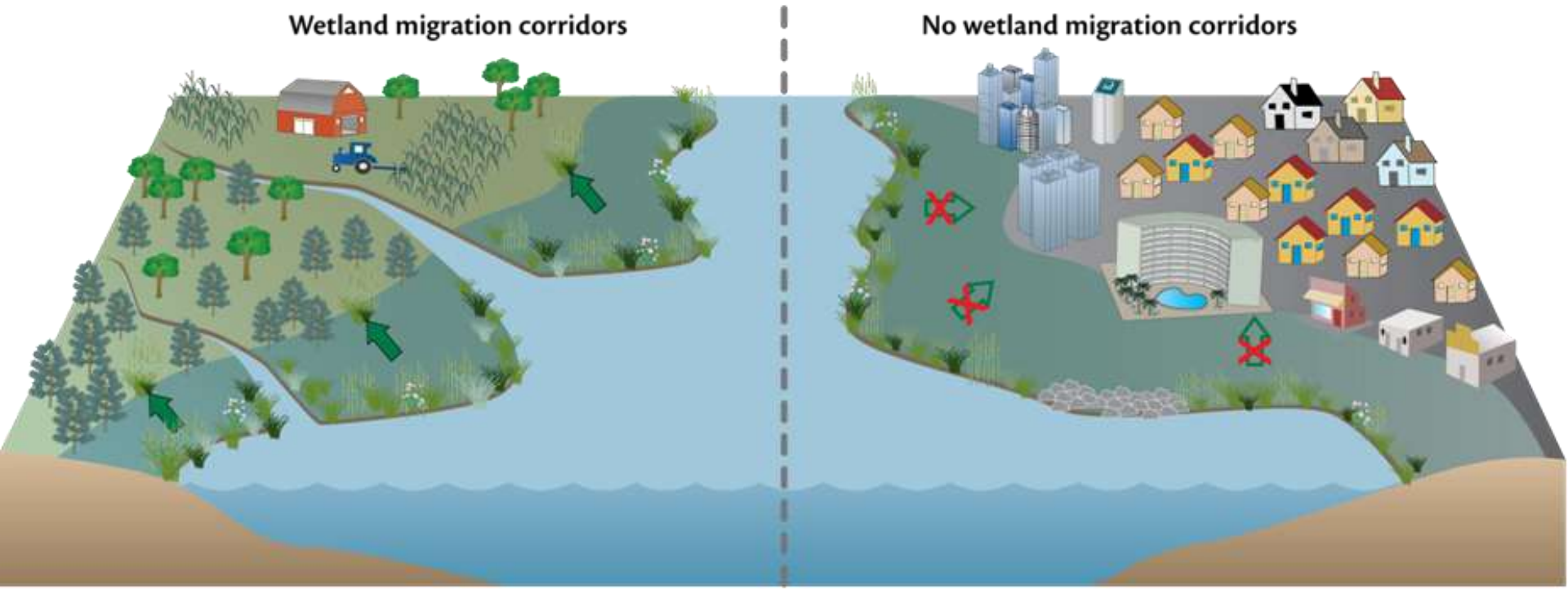
Source: Maryland Historic Trust (2010)

Strategy: Facilitate Movement of Coastal and Inland Ecosystems



Source: MD DNR (2010)

Strategy: Conserve and Restore Habitat Migration Corridors



Strategy: Promote Sustainable Shoreline & Buffer Area Management

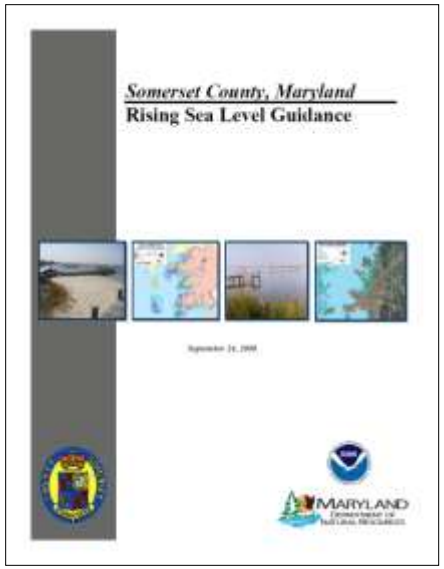
- Living Shoreline Protection Act (2008)
  - Requires non-structural shore protection practices unless proven infeasible
- Chesapeake & Coastal Bays Critical Area Amendments (2008)
  - Increased vegetative buffers
  - Updated jurisdictional boundaries to account for sea level rise
  - Allows for consideration of coastal impacts during growth allocation decisions

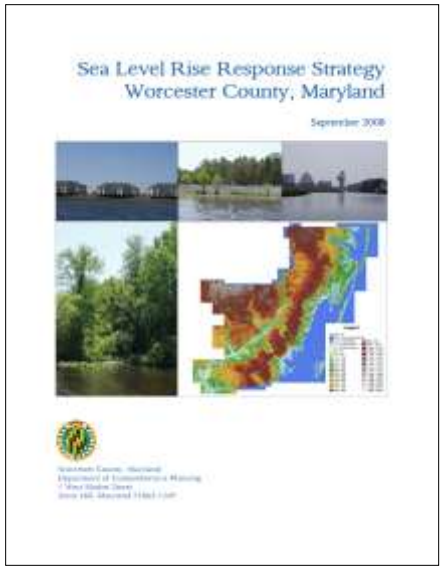
Adaptation Strategy: Institutionalize consideration of climate change

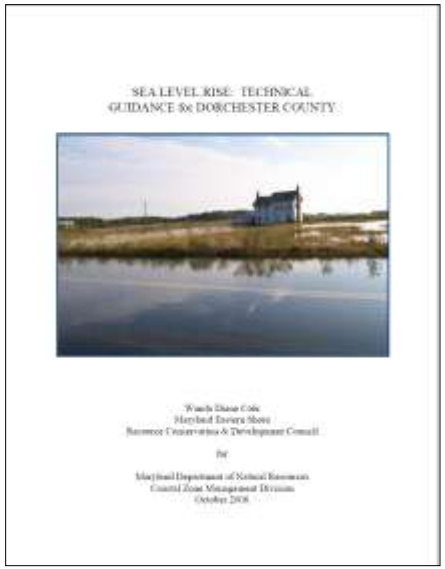
- Economic or "recognition-based" incentives
  - Condition grant funding
- Investment Policies
  - Siting & design standards for public infrastructure
  - "Funding policy" for "climate change impact areas"
- Incorporate sea level rise and climate adaptation strategies into hazard mitigation planning processes:
  - Vulnerability mapping
  - Plan Development (State & Local)
    - Hazard Mitigation Plans
    - Comprehensive Plans

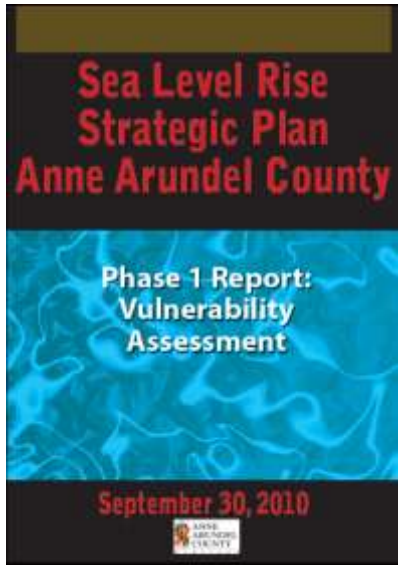
Strategy: Foster & Advise Local-Level Adaptation Planning

The Coastal Communities Initiative (CCI) competitive grant program provides financial and technical assistance to local governments to promote the incorporation of natural resource and/or coastal management issues into local planning and permitting activities.









Adaptation Strategies: Local Governments

- Institutionalize consideration of SLR
  - Improve link between long-range planning, capital improvement planning and emergency management
- Adaptation of vulnerable coastal infrastructure (protect, accommodate, retreat)
  - Use Comprehensive Planning process to guide/limit future growth & development in vulnerable areas
  - Sea Level Rise Overlay Districts
  - Transfer of Development Rights Program
  - Land Acquisition
  - Climate Change Adaptation Easements
- Building code revisions & infrastructure design standards
  - 2+ foot freeboard standard
  - Septic/Drainage/Stormwater Reserve Location Areas
- Public risk disclosure
- Forest and wetland protection
  - Designate and protect wetland and habitat migration corridors
- Sustainable Shoreline and Buffer Management
  - Living Shoreline Regulations
  - Buffer width expansion

Adaptation Strategy: Give State and local governments the right tools to plan and adapt

Strategy: Lead by Example

Building Resilience to Climate Change

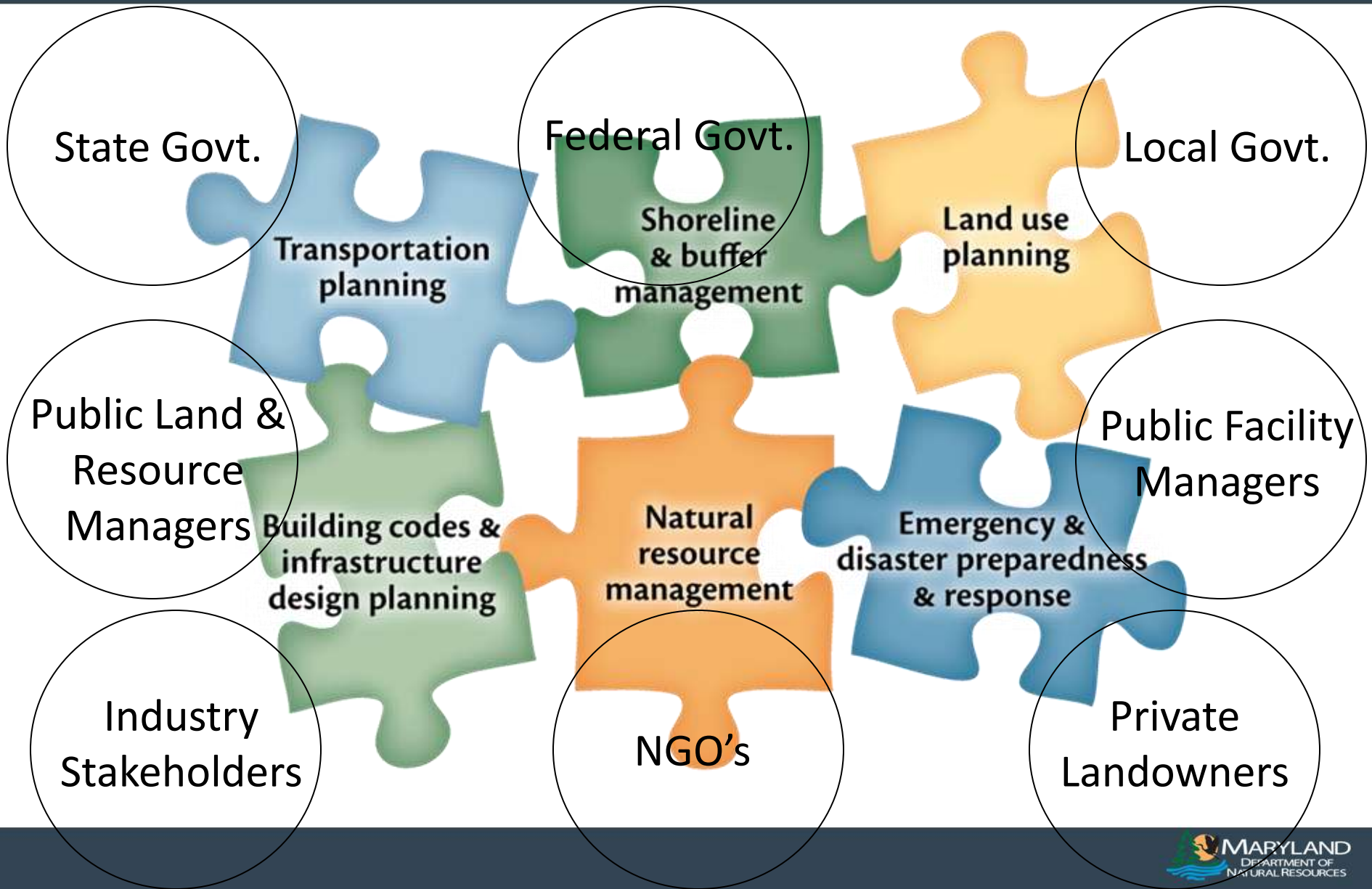
DNR policy to guide investments in and management of land, resources and assets so as to better understand, mitigate and adapt to climate change.

- New Land Investments
- Facility Infrastructure Siting & Design
- Habitat Restoration
- Research & Monitoring
- Resource Planning
- Government Operations
- Advocacy

MD Adaptation 2011 - 2012

- Critical Area Jurisdiction Mapping Update (Lead: DNR)
- Living Shoreline Protection Act-Regulation Development (Lead: MDE)
- DNR "Lead by Example" Policy
  - Land Conservation Assessment & Targeting Criteria
  - Infrastructure Siting & Design Criteria
- Local Government Technical & Financial Assistance: *Building Coast-Smart Communities*: (Lead: DNR)
- Maryland State Hazard Mitigation Plan – Sea Level Rise and Erosion Risk Analysis (Lead: MEMA)
- SHA Transportation Vulnerability Assessment and Risk Policy (Lead: MDOT)
- Maryland Port Administration Vulnerability Assessment (Lead: MDOT)
- Historical, Archaeological, and Cultural Resources Vulnerability Study (Lead: MDP)
- Climate Change Insurance Advisory Committee (Lead: MIA)
- Wildlife Action Plan – Climate Change Element (Lead: DNR)
- Green Print Update – Incorporation of Marsh Migration Model (Lead: DNR)
- State Development Plan: PlanMaryland – Criteria for "Climate Change Impact Areas" (Lead: MDP)
- Adaptation Toolbox: *The Coastal Atlas* (Lead: DNR)

Planning for Sea Level Rise: A Complex Planning Puzzle



Acknowledgements:
It takes a collective effort

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BURKE
environmental associates

Center for Climate Strategies
Helping States and Nations Tackle Climate Change

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